

# *Operating Guide*

## **ZENITH RADIO CORPORATION**

1900 North Austin Avenue  
CHICAGO, ILLINOIS 60639

MODELS Y931, Y932, Y934,  
and Y936

FOR YOUR  
**ZENITH**  
**STEREOPHONIC**  
**HIGH FIDELITY**  
**PHONOGRAPH**  
WITH  
**AM-STEREO FM TUNER**



## *There's a World of Entertainment and Pleasure In Your New Zenith Combination*

The magic phrase in sound reproduction today is "Stereophonic High-Fidelity." This new method of sound reproduction has created new horizons in home entertainment. This new electronic miracle brings to your home the thrilling experience of hearing music reproduced as though the artists are performing right in your home. Zenith Stereophonic High-Fidelity and Stereophonic FM is the culmination of decades of research to create the enchanting illusion of living musical presence. To better understand how this marvel of sound reproduction is accomplished let us first review some of the elementary principles of sound.

As we know, sound travels in waves similar to water waves. Everyone at one time or another has tossed a stone into a body of water and witnessed the expanding ripples that move outward in all directions. A small stone produces small waves and large stones produce large waves.

Sound waves travel in much the same manner. The wave in case of sound is referred to as air vibrations. A low note is one of a few vibrations, whereas, higher notes have more vibrations per second. These sound vibrations are received by us through the ears. The ears in turn transmit these vibrations through the auditory system to the brain, and we are able to hear and distinguish various sounds.

Hearing varies with all individuals. However, for high-fidelity reproduction, the practical human hearing range of sound extends from 30 cycles or vibrations per second, to 15,000 cycles or vibrations per second. It can be readily understood, therefore, that a true High-Fidelity system must faithfully reproduce every sound within this range, free of distortion.

In the past, conventional record players simply did not reproduce vibrations in excess of five or six thousand cycles per second, and the vital low frequencies or vibrations were not faithfully reproduced. It is the extension of the "highs" and the "lows," the brilliant overtones or harmonics that give high-fidelity music its rich, thrilling, musical presence. But High-Fidelity reproduction does not "just happen." Each component in your instrument is engineered to the highest quality standards. Each component like a link in a chain is dependent upon the performance of the other components to produce true High-Fidelity.



A single channel high-fidelity audio amplifier can be considered a "Monaural" sound system. By this, we mean that the recordings are made by using one microphone or group of microphones and then the information obtained from the orchestra or vocalist is channeled into only one recording. This single channel recording is then fed to a single channel amplifier and to a single speaker system.

Since man basically hears and interprets with what can be considered a "Binaural" mechanism, Zenith's engineering laboratories have developed new "Stereophonic" sound reproduction equipment which is most compatible with the hearing mechanism of man.

In a "Stereophonic" sound system, two microphones or groups of microphones are used and the information from each microphone or group is recorded separately; this is done with either a two channel tape recorder, or with a dual channel stereophonic record. The information from each recorded channel is fed to a separate audio amplifier and then the output of these separate audio amplifiers is fed to separate speaker systems. In this manner, sound can be recorded and reproduced stereophonically and man will hear as he is normally accustomed.

Radio broadcast transmissions are of two types. Amplitude Modulation (Standard-Broadcast) and Frequency Modulation (FM).

Frequency Modulation provides a tremendous improvement in the reduction of interference of static. In most installations, particularly those not too distant from the transmitting station, static of all types is entirely absent.

Frequency Modulation allows the transmission of not only a greatly increased tonal range, resulting in hearing musical instruments and sounds which previously have been unheard, but also of a greatly increased dynamic range, allowing the loudest and softest passages to be heard in their true proportions.

New standards for stereophonic FM broadcasting have been approved by the Federal Communications Commission which add an exciting new dimension to FM Radio listening. Zenith pioneered and developed the Stereophonic FM system on which the Federal Communications Commission based the broadcasting standards.

The Zenith engineers who created this basic Stereophonic FM system have also created for Zenith owners, new AM/FM tuners which will enable you to receive these new Stereophonic FM broadcasts (sometimes referred to as Multiplexing).

A Stereophonic FM tuner is installed in this cabinet and can be used to obtain the new full dimension Stereophonic FM broadcasts.

A dual professional type "Stereophonic Cartridge" is provided to insure complete listening satisfaction for the new High-Fidelity LP records, as well as the new Stereophonic records, and ordinary shellac records. This "Dual Stereophonic" cartridge Part No. 142-168 is a sensitive ceramic constant amplitude type cartridge. It has two styli, a .7 mil diamond for LP records and a 3 mil manufactured sapphire for 78 R.P.M. records. This cartridge is compatible in that it will not only play Stereophonic records but also standard Monaural records.

These models have a six speaker system. Two 10 inch woofers, two exponential horn tweeters, and two 3½ inch cone tweeter speakers.

The "tweeter speakers," reproduce the higher, more rapidly pulsating tones, while the large speakers, the "woofers," reproduce the lower slower pulsating tones.

As these Models are designed and manufactured, they feature a Stereophonic Cartridge, a Four Speed Record Changer, an AM-Stereophonic FM tuner, dual audio amplifiers for stereophonic sound and a dual speaker system.

## General

### POWER SUPPLY AND OUTPUT

Your Zenith amplifier, automatic record player and FM-AM Tuner are designed for operation on 110 to 125 volts, 60 cycle alternating current, AC.

*Do not attempt to operate on direct current (DC), or damage will result.*

If you are not certain of the type voltage or frequency in cycles of your electricity, check with the electric company.

If hum is apparent when operating the receiver, it may be reduced or eliminated by reversing the plug in the wall socket.

Power consumption for the amplifier, record changer and tuner is 50 watts. The EIA power output of the amplifier is 30 watts. This power output means that you have ample reserve above the requirements for any ordinary needs.

### TO PREPARE FOR OPERATION

1. Carefully remove all packing material from the record changer.
2. Turn the two base plate mounting bolts clockwise until they are flush with base plate, and remove the cardboard strips from either side of the record changer.



## ANTENNAS

**For The Broadcast Band:** This tuner is equipped with a built-in wave-magnet eliminating the need for an external antenna and ground under normal operating conditions. If hum is apparent when operating the set, move the AC cord away from the wavemagnet.

**For Frequency Modulation:** The special built-in Cabinet Antenna is designed for Frequency Modulation reception and in average locations where fairly strong signals are received from the transmitting station, this antenna system will provide good reception.

*In locations where electrical interference is experienced, particularly close to areas with heavy automobile traffic, or in locations where reception with the built-in antenna is marred with "noise" or distortion due to weak signals, it is very important that an external FM antenna be used. Also, in areas of marginal reception, a better antenna may be needed for stereophonic FM reception than for conventional monophonic FM.* To connect the lead-in from the external FM antenna to the receiver, first remove the cabinet antenna wires from the "F" and "G" terminal (See Fig. 1). Connect one side of the external antenna lead-in to the "F" terminal and the other side to the terminal marked "G."



Figure 1—Antenna Terminals

## DIAL CALIBRATION

**Standard Broadcast Band:** The AM dial scale is calibrated from 550 to 1600 kilocycles. A station listed as operating on 600 kilocycles will be found at 60 on your dial scale. A station listed at 1400 kilocycles will be tuned in at 140 and so on. Use this scale when the Selector Switch is rotated to AM position.

**Frequency Modulation Band:** The Frequency Modulation Band extends from 88 to 108 megacycles. This scale is used when the Selector Switch is rotated to either FM or AFC Position.

## TONE CONTROLS

The "Tone Controls"—bring a new concept to record tone quality. Continuously variable bass control permits desired emphasis or lows within the broad range of bass tone. Treble control lets you vary the highs along with the wide higher range to pick up the delicate tone of violins and coloratura soprano. Together these two controls give the finest tone quality for the most discriminating ear. (See Fig. 2.)

## STEREO MONAURAL SWITCH

The Stereo Monaural switch is the Push-Push type. When the switch is in the "out" position the unit is operating in the Monaural mode. When the switch is in the "in" position the unit is operating in the Stereo mode.

## BALANCE AND LOUDNESS CONTROL

The Balance and Loudness Controls are basically audio level controls for each amplifier. To place the two controls in their proper relationship, rotate both controls fully counterclockwise. To simultaneously raise or lower the output of the two amplifiers and have their outputs remain identical, it is only necessary to rotate the Loudness Control since this control will, by mechanical means, also cause the Balance Control to rotate.

Should you desire to balance the output of the amplifiers even more closely, place the Stereo-Monaural Switch in Mono Position, hold the Loudness Control firmly so it cannot move, and rotate the Balance Control until the sound appears to come from a point midway between the two speaker systems.

## Part One

## TUNER OPERATION

**STANDARD BROADCAST BAND:** Figure 2 shows the position of the Controls. To place the Tuner in operation, rotate the selector switch to AM position. This will turn on the Tuner and Amplifier.



To tune the receiver, turn the Tuning Control knob slowly to the desired station and adjust the Loudness Control knob to the right or left to the desired volume. To turn the Tuner OFF rotate the selector switch to OFF.

**FREQUENCY MODULATION BAND:** Rotate the Selector Switch to FM position. **TUNING THE RECEIVER ON THE FREQUENCY MODULATION BAND WILL REQUIRE MORE CARE THAN ON THE BROADCAST BAND.** A hissing sound may be noted when tuning between Frequency Modulation stations. This is normal, and will disappear as the station is tuned in. After a station is located, the pointer should be moved back and forth over it until the point of quietest reception and best tone quality is found. Correct tuning is indicated by the disappearance of background noise. Although Frequency Modulation stations are heard over great distances on rare occasions, do not expect to tune in other than your local stations. The nature of Frequency Modulation transmission limits reception to areas within the approximate horizon.

#### STEREOPHONIC FM INDICATOR

When the FM station to which you are tuned is transmitting stereophonically, the Stereophonic Indicator on the Tuner control panel (See Fig. 2) will light up indicating the tuner is receiving a stereophonic program. Should you tune to a monaural FM program the Indicator will not light up, indicating the receiver is operating monaurally and receiving a monaural program.

#### AUTOMATIC FREQUENCY CONTROL (AFC)

This receiver features an automatic frequency control which automatically keeps your receiver on the exact station frequency when you are tuned to an FM station. To utilize this feature tune the receiver as instructed under "Frequency Modulation" and rotate the Selector Switch to AFC Position.

When retuning to another FM station always rotate the selector switch to FM position until properly tuned in and then rotate the Selector Switch to AFC.

When the desired FM station is a weak station, adjacent in frequency to a strong station, the AFC may pull the tuning into the stronger station. Under these conditions, rotate the Selector Switch to FM position, and tune the receiver as instructed under "Frequency Modulation."

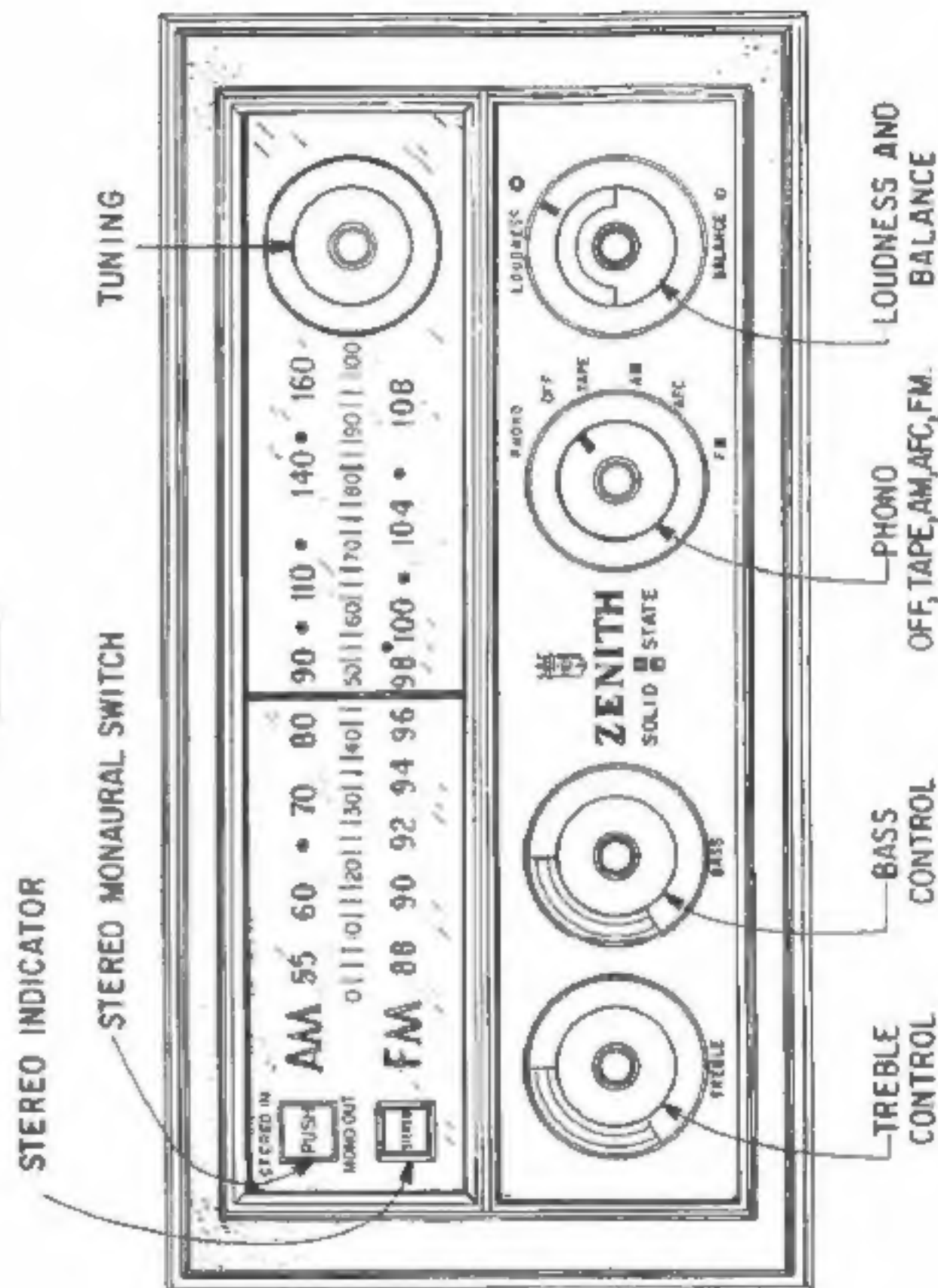


Figure 2—Control Panel



## Part Two

### MONAURAL PHONO OPERATION

1. Rotate the Selector Switch to Phono Position. (Fig. 2.)
2. Place the Stereo-Monaural Switch in Mono Position.
3. Adjust the Balance and Loudness Control as previously instructed.
4. Proceed as instructed in either Parts Four or Five.
5. Adjust Loudness and Tone controls as desired.

## Part Three

### STEREOPHONIC PHONO OPERATION

1. Rotate the Selector Switch to Phono Position. (Fig. 2.)
2. Place the Stereo-Monaural Switch in Stereo Position.
3. Adjust the Balance and Loudness Control as previously instructed.
4. Proceed as instructed in either Parts Four or Five.
5. Adjust Loudness and Tone controls as desired.

## Part Four

### AUTOMATIC RECORD CHANGER OPERATION

1. Rotate the Selector Switch to Phono Position.
2. Lift and rotate the record pressure arm counterclockwise. Place records on spindle, and place record pressure arm on top of records.



Figure 3—Stylus Selector

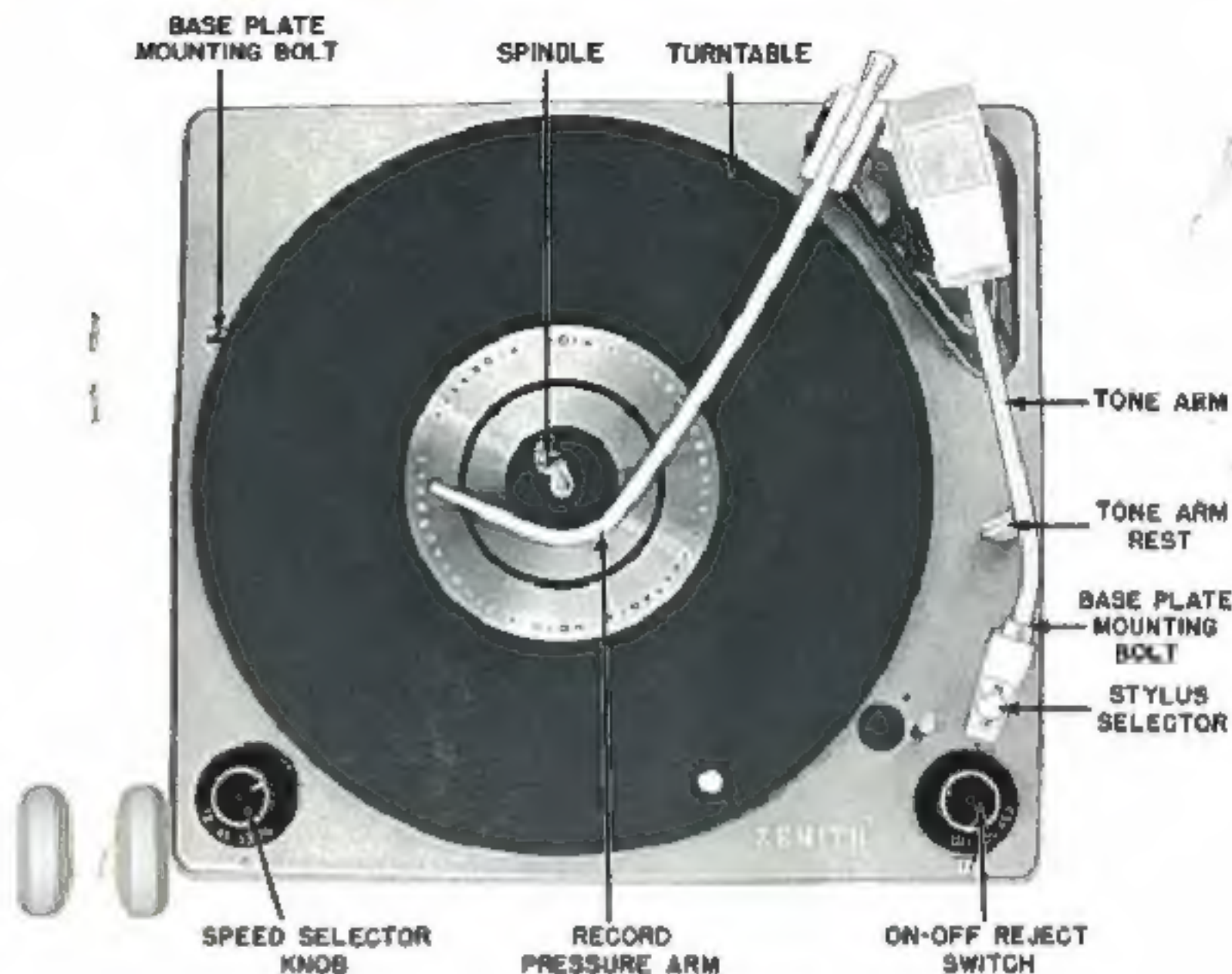


Figure 4—Changer, Top View

3. Rotate the speed selector knob to 78, 45, 33 or 16 R.P.M. position, depending upon the speed of the record being used. (See Fig. 4.)
4. To rotate the stylus selector to either "78" or "LP" position, place tone arm onto tone arm rest, push stylus selector down and rotate 180° (See Fig. 3). The choice will be determined by the type record being played.
5. Turn the On-Off reject switch on the changer to reject and release it. The changer will automatically play all records on the spindle. After the last record is played the tone arm returns to the rest and the complete unit will be turned off.
6. Adjust loudness control to desired level.

This unit will automatically play a stack of six 10", six 12" or six 7" records. It will also intermix any six 12" and 10" records of the same speed.



## Part Five

### MANUAL PHONO OPERATION

1. Lift and rotate the record pressure arm counterclockwise until it reaches a definite stop position.
2. Place a record over the spindle and then down to the turntable.
3. Move the speed selector knob to 78, 45, 33 or 16 R.P.M. position depending upon the speed of the record being used.
4. To rotate the stylus selector to either "78" or "LP" position, place tone arm onto tone arm rest, push stylus selector down and rotate 180° (See Fig. 3). The choice will be determined by the type record being played.
5. Turn the On-Off reject switch to "On."
6. Pick up the tone arm and place it on the record. When the record has finished playing, the tone arm will return to the tone arm rest and the turntable will continue to rotate.
7. Turn off the complete unit by rotating the ON-OFF Reject switch to OFF position.



Figure 5

#### 45 R.P.M. FLAT ADAPTER

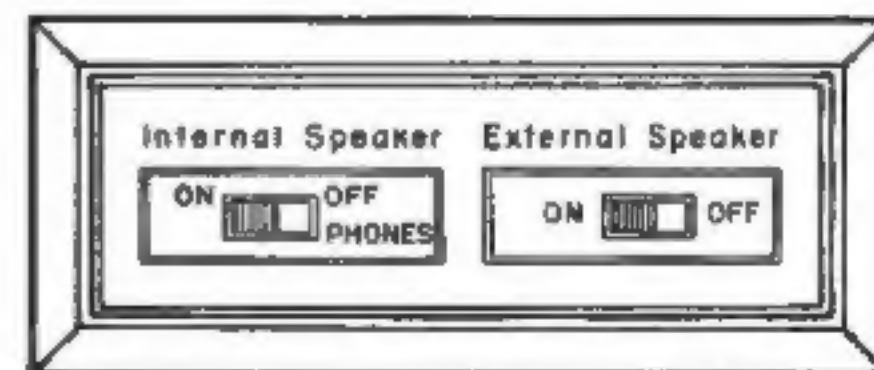
To install the flat 45 R.P.M. adapter simply grasp it and point the arrow at the rear of the tone arm, place it over the changer spindle pressing firmly down to the turntable. See Fig. 5.

To remove the 45 R.P.M. records that have been played it is only necessary to lift the 45 R.P.M. adapter off the record changer. The records can then be removed from the turntable.



### FULL-RANGE EXTENSION SPEAKER SYSTEMS

Should you have a room that will accommodate a larger speaker system or desire to place extension speakers in an adjacent room, Zenith engineers have created two supplemental Extension Speaker Systems that can be used in conjunction with this instrument.



Speaker—Earphone Switches

Extension Speaker S2434 has a 6x9 woofer and a  $3\frac{1}{2}$  inch tweeter. Extension Speaker S2437 has a 12 inch woofer and an exponential horn tweeter.

For a normal installation use a pair of S2434 Extension Speakers. In the event you desire improved low and high frequency response use a pair of S2437 Extension Speakers.

To install an Extension Speaker connect the brown wire with yellow tracer to the + terminal and connect the brown wire to the - terminal.

The above connections should be made for each extension speaker.

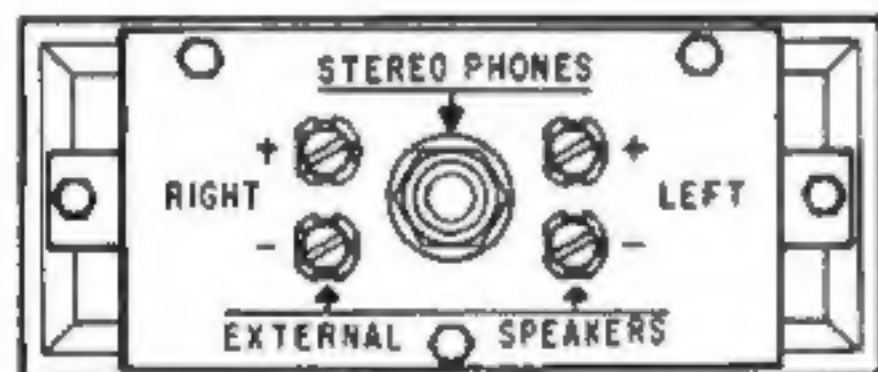
1. For Extension Speaker Operation Only:

Place external speaker switch in ON position and internal speaker switch in OFF position.

2. For simultaneous operation of extension and internal speakers place the internal and external speaker switches in ON position.

3. For Internal Speaker Operation Only:

Place internal speaker switch in ON position and external speaker switch in OFF position.



Speaker-Earphone  
Terminal Board

### STEREO HEADPHONES

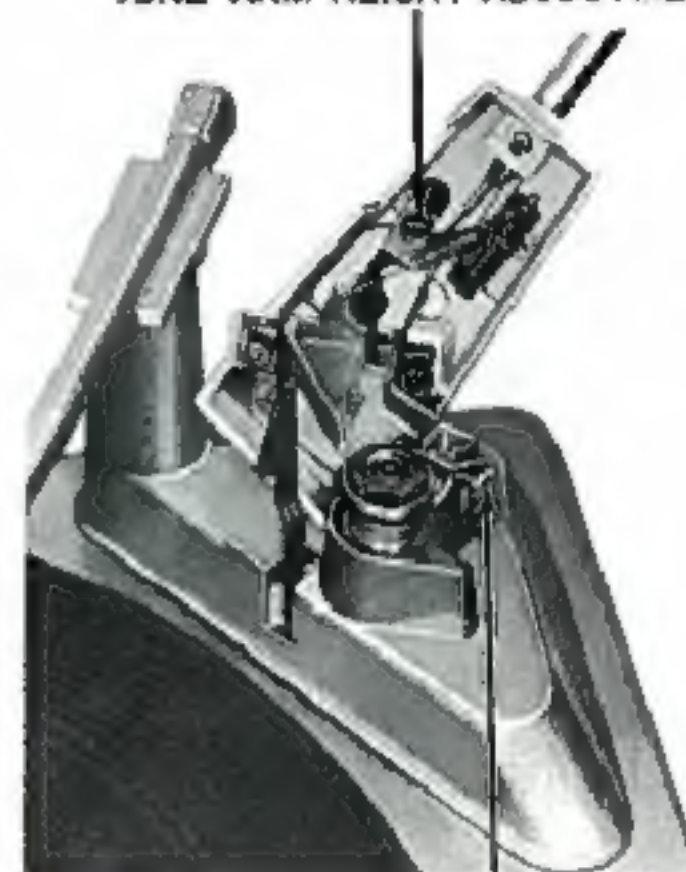
Zenith Stereo Headphone #839-2 can be used with this unit. Plug it into the stereo phone jack provided. Place the internal speaker switch in phone position. The external speaker switch can be in ON or OFF position.

### TONE ARM HEIGHT ADJUSTMENT

The tone arm height is adjusted by means of the height adjustment screw. To raise the tone arm turn this screw counterclockwise. To lower the tone arm turn the screw clockwise.

The tone arm height should be adjusted so that with a  $\frac{1}{8}$ " stack of records on the turntable the tone arm lifts  $\frac{1}{8}$ " straight up as the change cycle starts.

### TONE ARM HEIGHT ADJUSTMENT



### TONE ARM SET-DOWN ADJUSTMENT

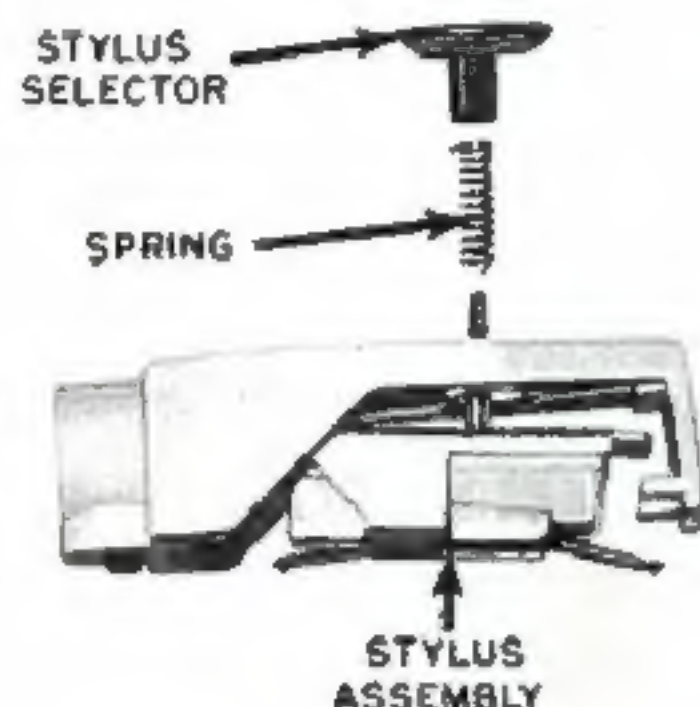
### TONE ARM SET-DOWN ADJUSTMENT

If the needle falls off the record, lift the tone arm, and turn index screw on the tone arm support a small amount until the needle lands in the correct position.



## TO REPLACE STYLUS ASSEMBLY S68567 USED ON CARTRIDGE 142-163

1. Pull off stylus selector knob.
2. Unlock spring from retaining groove of stylus stem and remove it.
3. Remove stylus assembly from cartridge.



The input impedance of each tape circuit is approximately one megohm.

To play a monaural tape recorder through this audio system plug into the right input terminal, rotate the selector switch to tape position and place the Stereo Monaural switch in Mono Position.

To play a stereo tape recorder through this audio system, plug into both input terminals, rotate the selector switch to tape position and place the Stereo-Monaural switch in Stereo Position.

The output impedance of each tape circuit is approximately 15K ohms.

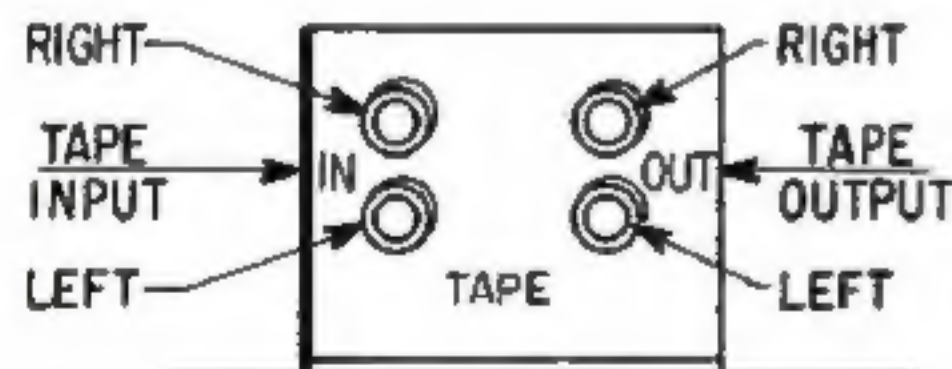
To record from this unit with a monaural tape recorder, plug into the right output terminal, place the Stereo Monaural switch in Mono Position and rotate the selector switch to whatever function position from which the recording is to be made.

To record from this unit with a stereo tape recorder, plug into both output terminals, place the stereo monaural switch in stereo position and rotate the selector switch to whatever function position from which the recording is to be made.

## TAPE INPUT AND OUTPUT TERMINALS

Tape input and output terminals have been provided at the back of the receiver which enable the user to connect the following equipment:

1. A Monaural Tape Recorder
2. A Stereophonic Tape Recorder



Tape Input and Output Terminals



Model Y 931

2541247

## Warranty

Zenith Radio Corporation warrants the parts, transistors and tubes in any Zenith radio receiver, phonograph, high fidelity and stereophonic instrument, including combinations of all of the foregoing (with the exception of batteries) to be free from defects in material arising from normal usage. Its obligation under this warranty is limited to replacing, or at its option repairing any such parts, transistors or tubes of the receiver which, after regular installation and under normal usage and service, shall be returned within ninety (90) days from the date of original consumer purchase of the receiver to the authorized dealer from whom the purchase was made and which shall be found to have been thus defective in accordance with the policies established by Zenith Radio Corporation.

The obligation of Zenith Radio Corporation does not include either the making or the furnishing of any labor in connection with the installation of such repaired or replacement parts, transistors or tubes nor does it include responsibility for any transportation expense.

Zenith Radio Corporation assumes no liability for failure to perform or delay in performing its obligations with respect to the above warranty if such failure or delay results, directly or indirectly, from any cause beyond its control including but not limited to acts of God, acts of government, floods, fires, shortage of materials, and labor and/or transportation difficulties.

### CONDITIONS AND EXCLUSIONS

This warranty is expressly in lieu of all other agreements and warranties, expressed or implied, and Zenith Radio Corporation does not authorize any person to assume for it the obligations contained in this warranty and neither assumes nor authorizes any representative or other person to assume for it any other liability in connection with such Zenith radio receivers, phonographs, high fidelity and stereophonic instruments or parts, transistors or tubes thereof.

The warranty herein extends only to the original consumer purchaser and is not assignable or transferable and shall not apply to any receiver or parts, transistors or tubes thereof which have been repaired or replaced by anyone else other than an authorized Zenith dealer, service contractor or distributor, or which have been subject to alteration, misuse, negligence or accident, or to the parts, transistors or tubes of any receiver which have had the serial number or name altered, defaced or removed.